

Respiratory exposure with acrylonitrile butadiene styrene particle in appliance company workers

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*Abstract

Background: Acrylonitrile butadiene styrene granules heat up from 169 to 320°C in the production of household appliance, which results in the decomposition of white smoke in the work place.

Objective: Staff respiratory exposure with ABS granules vapors and dust examined.

Methods: This analytical case-control study was performed on 78 persons of appliance manufacturing company in Qazvin, in 2016. Particles measurement 0.3 and 2.5 microns by Micro Dust Pro devices and Dust Counter and spirometry test were performed by Minispir. FEV1, FVC, FEV1/FVC parameters before and after invention platform on 8 meters height and respiratory signs staff complaints were considered by COPD assessment test.

Findings: Forty-eight persons that exposed with vapor and dust ABS plastic material mostly had a lot of complaints to the frequent respiratory symptoms of cough and sputum occasionally. Spirometry indices coldwall staffs on the second floor including FEV1, FVC and the ratio FEV1/FVC were significantly decreased respectively (6.52%, 5.66%, 3.56 lit) during 2 years ($P<0.05$) and for coldwall staffs on the first floor, FEV1 and FVC significantly decreased respectively (9.26% and 5.6%) ($P<0.05$). But the ratio FEV1/FVC was not significant decreased. The three above mentioned indices for injection plastic staffs had significantly reduced ($P<0.05$), and increased for administrative staffs. Concentration of inhaled particles was 0.23 ± 0.067 on the floor and particle at platform 0.62 ± 0.24 mg/m³.

Conclusion: It must be avoided to create a platform on the top of the hot source, such as plastic injection process.

Keywords: Pulmonary function test, COPD Assessment test, Spirometry, ABS granules

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